Watching the Evidence: An HSR to Guide the Preservation of George Washington's Mount Vernon

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With the enthusiastic support of its owner, the first historic preservation organization in the United States, one of the nation's most famous homes was thoroughly analyzed and documented.

Introduction

To be most effective, a historic structure report should be an integral part of the preservation process. The information gathered needs to be organized and presented in a manner that is useful for all levels of intervention in the fabric of the building, from normal maintenance to complete restoration. Every historic structure report must be suitable to the particular building; a historic structure report for a state capitol or a large public building should be different from one for an adaptively-used commercial building, which in turn should be different from one for a historic house.[1]

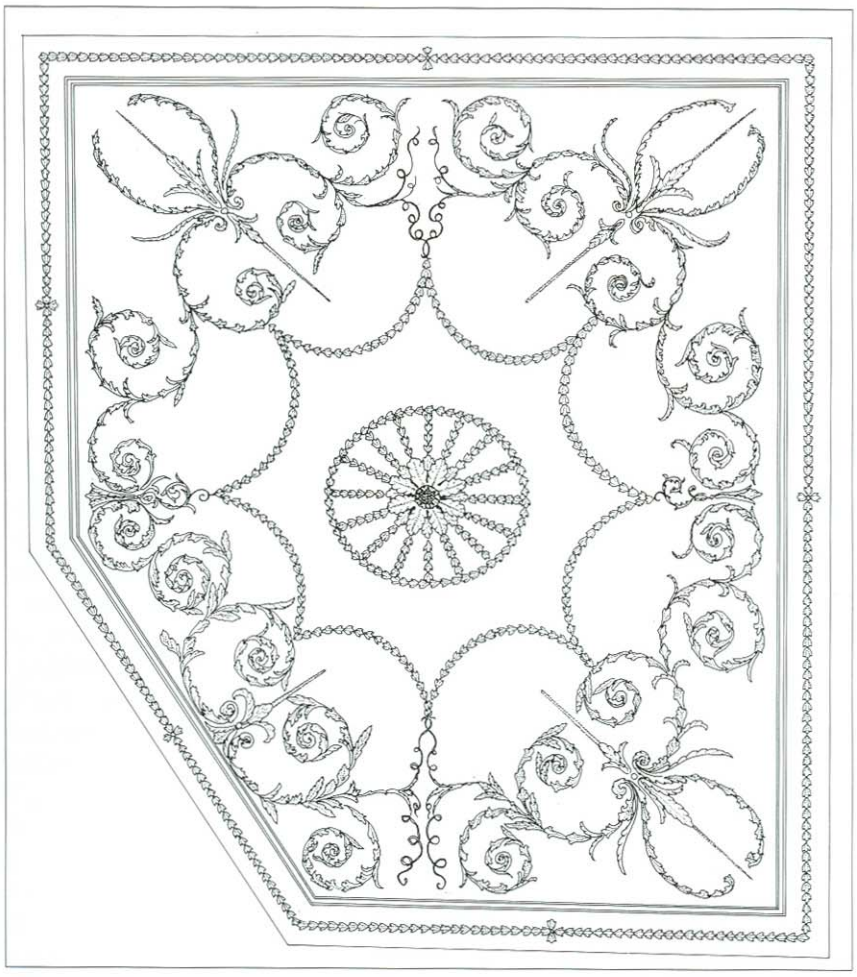

Fig. 1. Reflected ceiling plan for the small dining room. This drawing was used to document the consolidation of the dining room's plaster ceiling. Illustrations prepared by John G. Waite Associates, unless otherwise noted.

Although Mount Vernon was the first building in the United States to be preserved by a private organization for its historical value, a comprehensive historic structure report had never been prepared for the building. Over the years, tens of thousands of documents relating to the history of the property had been collected, but a single document that evaluated and organized the information did not exist.

The Mount Vernon historic structure report was carefully designed to meet the long-range needs of one of the most significant historic houses in the United States. Not only did the report deal with historical questions such as the evolution of the house over three centuries, but it also addressed the building's existing conditions and included a sophisticated computerized monitoring program that recorded the changes in temperature and humidity conditions throughout the building. The report provided, for the first time, a definitive understanding of the history and evolution of the building and a comprehensive analysis of the condition of its fabric. This information was used to prepare a long-term program for the continued preservation and conservation of the mansion, as well

as to provide the foundation for immediate restoration work.

In 1990 Mesick·Cohen·Waite Architects, with John G. Waite as partner-in-charge,[2] was selected by the Mount Vernon Ladies' Association of the Union to prepare the historic structure report for the mansion. Although the firm had prepared over one hundred historic structure reports, including reports for The Octagon, Monticello, Jefferson's buildings at the University of Virginia, and the state capitols of Tennessee and Pennsylvania, the Mount Vernon report proved to be the most comprehensive and complex. It included elements, such as a computerized data-acquisition system for monitoring temperature and humidity conditions and a history of the measured drawings that had been made of the building, uncommon in such reports. The Mount Vernon report utilized a specialized format, described below, that was well suited to addressing the particular problems of the mansion.

From the beginning, it was the intent of the architects to develop a historic structure report for Mount Vernon in which all existing information regarding the mansion was gathered and organized; it was to be a comprehensive report, including recommendations for the building's long-term preservation and conservation. The value and significance of the estate's original building fabric has long been appreciated, as evidenced in this 1935 statement by the Mount Vernon Ladies' Association Committee on Barns and Outbuildings:

> At Mount Vernon, no structure in any way original, or thought to be, should be touched even for routine repairs, no part of the ground disturbed even for planting a shrub or relaying a walk without watching the evidence. Unless this method is pursued *and the future of the whole estate* always kept in mind, the only key which would open the doors for future knowledge may be destroyed and irrevocably lost.[3]

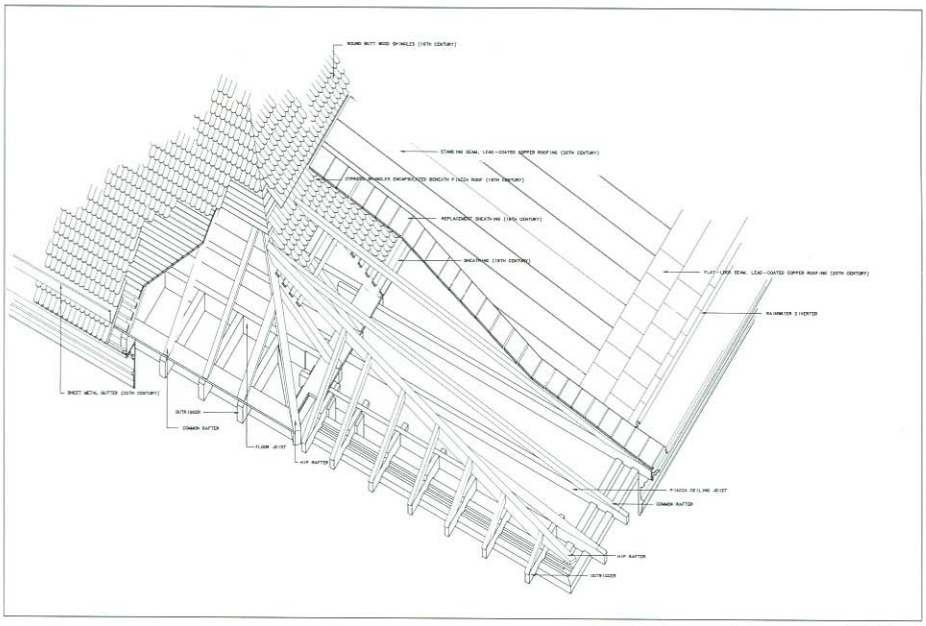

Fig. 2. Axonometric view of the southeast corner of the piazza, showing the original wood-shingle roof encapsulated within the piazza.

These words are as true today as they were in 1935. The survival of the mansion, with virtually all of its original building fabric intact, is the result of the dedicated efforts of the Mount Vernon Ladies' Association, the nation's first historic preservation organization. Since purchasing the property in 1858, the association has operated without government funding or assistance. The mansion has been revered as a shrine since Washington's death and achieved great symbolic importance: more than fifty million people have visited the estate during the association's ownership. Today, it remains the most visited historic-house museum in the United States, with approximately one million visitors annually. This high visitation rate has put a great deal of stress on the building.

The historic structure report, which was funded in part by the Getty Grant Program, was carried out by the architects with the participation of the Mount Vernon staff.[4] Neil Horstman, formerly resident director of the Mount Vernon Ladies' Association and now executive vice-president of the White House Historical Association, was instrumental in the development and oversight of the project. In order to ensure maximum coordination between Mount Vernon and the architects, a special committee of Mount Vernon staff members was established to review the project.[5]

The Mount Vernon report has been cited by funding officials as the most comprehensive such report for a single building in the United States. It comprises three volumes containing more than 900 pages of text and drawings. It took two-and-one-half years for a team of architects, architectural historians, and building conservators to complete. For the first time, all of the documentary information was gathered, evaluated, and categorized for easy access in the future — thousands of pages of primary and secondary documents, as well as hundreds of pages of architects' field notes and sketches. Every surface and feature of the exterior and interior was visually inspected, probed, and analyzed to determine its place in the evolution of the house.

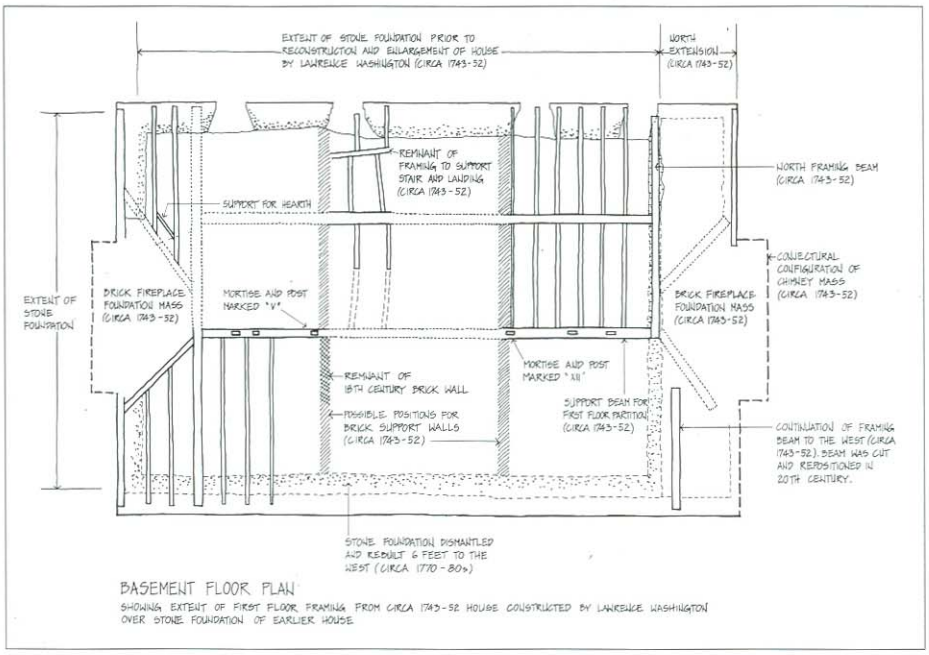

Fig. 3. Evidence of Lawrence Washington's 1743-52 house was most apparent in the basement. Lawrence built his house on the stone foundation of an earlier house. George Washington used those stone walls and some of the framing from his brother's house in his initial expansion. This basement floor plan shows the extant c.1743-52 framing members that support the first floor rooms.

Based on the investigation, several construction projects were carried out under the supervision of the architects. These included stabilization projects, such as the structural reinforcement of the original main stairway framing and the consolidation of the original decorative plaster ceiling of the small dining room, using an acrylic injection process; major restoration projects, such as the replacement of the mansion's wood-shingle roof, using first-growth cypress, and the restoration of the original cupola; and smaller projects, such as the reconstruction of George Washington's original house-bell system and the repair of some of the original window sash. Considerable information concerning the evolution of the house was discovered during these construction projects, and the illustrations, working drawings, and reports that accompanied the work were incorporated into the final historic structure report (Figs. 1 and 2).

History

The mansion in its present form evolved over almost a half century of ownership by George Washington. The nucleus of the house includes a small 1740s structure constructed by George's half-brother, Lawrence Washington, over the foundation of an earlier building. This core had a significant effect on the appearance of the later house (Fig. 3). Nevertheless, the house as it exists today is the creation of George Washington. In tracing the evolution of the mansion, Washington's abilities as a designer became apparent. Although he was concerned about expenditures, Washington pursued ambitious construction projects, and rarely did construction cease at Mount Vernon during his lifetime (Fig. 4).

Not only were there major construction campaigns, but the maintenance of the building required constant attention. As early as 1797 Washington wrote, "An eight years absence from home ... has thrown my buildings into so much disorder that at no period in my life have I ever been more engaged than in the last six or eight months to repair and bring them into tune again."[6]

When Washington died in 1799, his estate was divided among his many heirs. Mount Vernon itself passed into the possession of his nephew, Bushrod Washington, who, in turn, passed it to his nephew, John Augustine Washington. Between 1799 and 1860 there never were sufficient funds to maintain the buildings. By 1860, when Mount Vernon was acquired by the Mount Vernon Ladies' Association, its original 8,000 acres had been reduced to 1,200. The roof of the mansion was

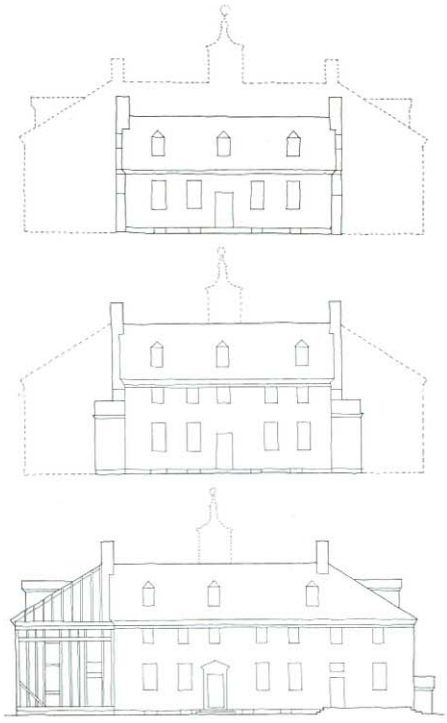

Fig. 4. Series of west elevations, showing the evolution of the mansion from 1743-52 (Lawrence Washington), to the initial work by George Washington in 1757-58, and the enlargement of the house in 1775. These elevations, together with evolutionary floor plans, summarize the archival research and physical investigations carried out during the preparation of the historic structure report.

Fig. 5. Mount Vernon in 1858, showing its deteriorated condition, particularly the piazza. Photograph courtesy of The Mount Vernon Ladies' Association of the Union.

leaking badly, the portico was near collapse (its roof propped up with old sailboat masts), and the entire building was in need of painting (Fig. 5). Since the Mount Vernon Ladies' Association acquired the building, there have been numerous construction and restoration campaigns, as well as ongoing maintenance efforts. For some of these projects there were copious records, while others were barely documented.

One of the primary challenges of the historic structure report was to sort through the vast amount of written documentation concerning the mansion. To aid in the archival research, the Mount Vernon Ladies' Association provided an intern who read through George Washington's published papers and through the association's annual reports and documents. The intern worked with the architects' staff to create a file for each room, which formed the basis for an invaluable index to the collection.

The historic structure report contained an architectural history fully documenting the eighteenth-century development of the house for the first time. Data on later modifications was incorporated into the chapters for each room. Using the association's files, the architects created a chronology for each room that listed every recorded modification and then supplemented the chronology as additional physical information was uncovered. Chronologies were also prepared for each building system, for the exterior details of the house, and for the roof. Each chronology provided a quick, yet thorough, reference for the history of the individual spaces.

The architects also prepared a chapter on the eighteenth-century workmen who built and modified the house, giving a short biography of each primary craftsman and a description of his work. This chapter described the types of workmen (slaves, indentured servants, and self-employed artisans) and outlined their terms of employment. An accompanying table listed every known craftsman, his trade, and his dates of employment.

Architectural Assessment

The architectural assessment of the mansion forms the core of the historic structure report. Early in the project the architects determined that each room warranted its own critical analysis, including a history (from construction to the present); a chronology, recording each archival reference to the room; a written description, identifying each room element and its historic value; a drawing of each door, with sketches and details of its hardware; and an evaluation of the room's condition, supplemented by floor plans (showing each floorboard) and elevations of the windows, showing cracks and identifying marks (Fig. 6). Also included was information about the furnishing of each room during the Washington era.

Each surface or element was carefully inspected. Hardware was removed, studied, photographed, and the underlying surfaces were scrutinized for evidence of earlier fittings. Paint samples from various architectural elements were analyzed; the number and type of paint layers were compared to quickly determine an element's relationship and place in the long history of the house. Every molding was measured and compared to the profiles drawn for the 1930s measured drawings. Archival photographs that recorded previous restoration campaigns were studied meticulously and compared to the existing conditions. The most important "tool" used throughout the investigation was a disciplined observation of all conditions inside and outside of the mansion, unencumbered by preconceived notions or past theories concerning the structure's evolution.

Particular attention was paid to the cellar, because it survived relatively intact and had never been restored. The cellar has never been part of the public tour, nor did it figure prominently in Washington's writings or in early archival material, so that the documentation available for the other spaces in the mansion was not as available for the cellar. Consequently, the architects prepared a permanent visual record and comprehensive document for that space, including illustrations ranging from drawings as simple as a floor plan showing the various paving patterns to detailed diagrammatic plans of the first-floor framing that showed each member and determined its wood type, period, and any identifying marks. Elevations of each wall were prepared to show condition, problems of repair, and illustrations of concurrent archeological probes. Together with the written architectural assessment of the cellar, these documents will provide a foundation upon which future archeology and conservation can build. The cellar proved to be the best location for understanding the complex evolution of the house. All of the evidence was there, waiting to be discovered.

Printed Architectural Sources for the Mansion

It has long been known that elements of the mansion were derived from architectural handbooks and patternbooks. Surviving correspondence documents Washington's interest in the ornamental elements of his house, although he did not specify these elements in the detailed manner that Thomas Jefferson used in the ornamentation of Monticello. Washington owned only one pattern book, Francis Price's *The British Carpenter* (5th ed., 1765), but many of the mansion's architectural elements were based on the patternbooks of Batty Langley, who published books on landscape, as well as architecture.

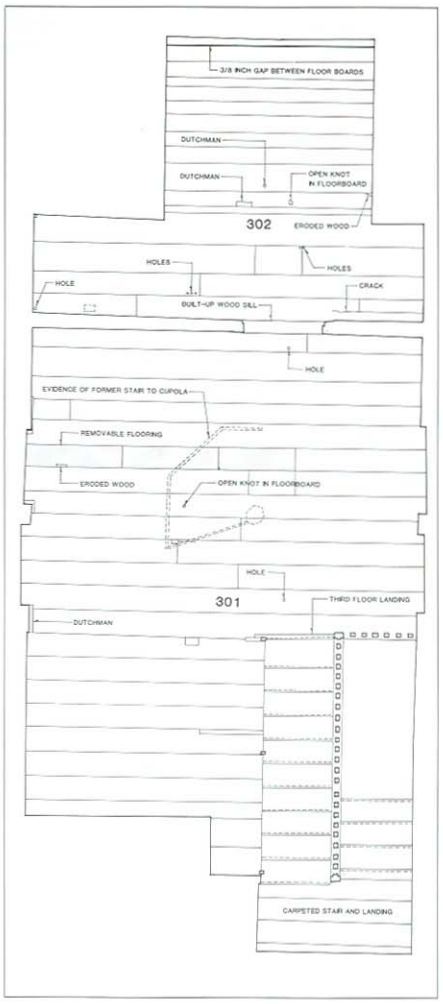

Fig. 6. Floor plan for the third-floor stair hall, 1993. Similar plans were produced for each room of the house, based on field notes and sketches prepared under the direction of Morley Jeffers Williams in the 1930s.

To understand fully Washington's design process, a wide range of primary and secondary sources were reviewed. As in other aspects of research and restoration, the Mount Vernon Ladies' Association was at the forefront. As early as the 1930s the director of research and restoration, Morley Jeffers Williams (a former professor of landscape architecture at Harvard's Graduate School of Design) began documenting the sources from which elements were taken. Moreover, a number of books and articles have cited the sources for the most decorative and sophisticated of the architectural elements. The architects reviewed and summarized all of these findings in the report and then determined sources for some of the previously overlooked elements, such as the downstairs bedroom mantel.

Measured Drawings

Mount Vernon was one of the first buildings in the United States to be documented by measured drawings. One section of the historic structure report was developed to review documentation drawings — those drawings that record the architecture of the structure. These drawings began with Samuel Vaughan's 1787 scaled plans of the mansion and the site. Alexander Jackson Davis produced at least five drawings of the mansion in 1830 or 1831. In 1876 Van Campen Taylor produced the first set of accurate architectural measured drawings of the mansion known to survive, and these documents are among the earliest measured drawings of an American building. At least nine more sets of drawings were done before Williams produced a remarkable set of measured drawings in the 1930s (Fig. 7).

Utilizing his background in land surveying, Williams developed a measured-drawing system that relied on a series of buried markers and surveying instruments. The survey grid that Williams created was independent of the building so that it could be reproduced in the future to monitor building movement. Although the field notes, markers, and drawings are still extant, the measuring system had not been replicated until the preparation of the historic structure report. To determine the accuracy of the system and the subsequent measured drawings and thereby their relevance to the historic structure report, the architects recreated the system, noting any discrepancies. Williams's drawings proved

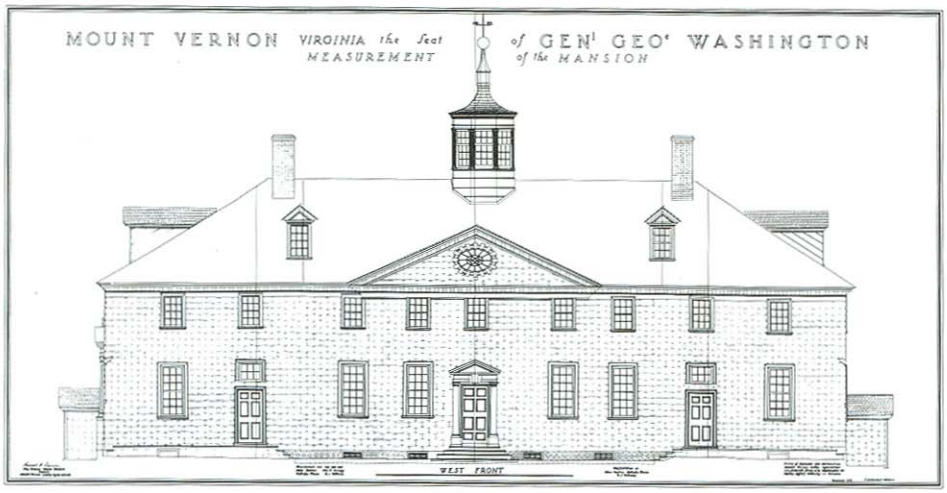

Fig. 7. West elevation, part of the series of measured drawings prepared under the direction of Morley Jeffers Williams, 1937. Courtesy of The Mount Vernon Ladies' Association of the Union.

to be remarkably accurate in recording the existing conditions of the mansion and in determining changes since the 1930s. Because the Williams drawings did not include plans of the cellar or roof, the architects produced measured drawings so that today, for the first time, a comprehensive graphical record of the mansion exists.

Building Systems

In many ways the electrical, heating, security, and fire-protection systems of the mansion illustrated the development of building technology over a two centuries and, therefore, these systems required specific documentation. For example, the first electrical system for the estate, an Edison storage-battery system with a generator for charging the batteries, was installed in 1916; the installation was inspected by Thomas Edison himself. In 1922 the direct-current electrical system was upgraded upon Thomas Edison's recommendation to use only an "isolated (electrical) plant without any connection with an outside source of electricity."[7] Outside sources of electricity were not considered to be dependable. It was not until 1935 that the estate contracted for electrical service from a public utility.

Fire prevention and suppression measures taken at Mount Vernon, beginning in 1860, have been at the forefront of fire detection and protection development in the United States. Henry Ford donated a chemical truck in 1923 and a pumper in 1936. In 1981 a Halon fire-suppression system was installed, and today Mount Vernon is unusual among historic sites in having its own fully trained and equipped fire department.

The heating system originally consisted of individual fireplaces and a stove on the third floor. This system was augmented in 1870 with a furnace in the cellar. In 1886 it was discovered that the furnace had charred adjacent framing, and by 1898 the vice regents of the Mount Vernon Ladies' Association voted unanimously to install a hot-water heating system with a remote boiler. This system, with boiler replacements, remains in service today, and the concept of the remote boiler remains at the forefront of preservation philosophy. Changes can be made to this system without repeated physical intervention in the building.

Research for the historic structure report also revealed Mount Vernon's long history of security systems, beginning in 1877 when an electric burglar alarm was installed at George Washington's tomb. A burglar-alarm system was installed at the mansion in 1915, and following the theft of Washington relics in Alexandria, Virginia, Harrison H. Dodge, the estate superintendent, recommended an "elaborate system of invisible wiring."[8] An electric-eye detection system was installed in the mansion by 1941. Changes have been explored, tested, and adopted as appropriate for the needs of the buildings and collections. As with the development of a fire department, the Mount Vernon Ladies' Association has supplemented the security systems with the creation of an internal security force.

Other building systems that were important for the original purpose of the mansion have been investigated and re-created as appropriate. In particular, George Washington's housebell system, dating to the 1780s, was re-created after archival research and physical investigation. The bell system is well documented in Washington's account book and weekly farm reports, as well as in a painting and several early photographs. Physical investigations and probes were made following a visual survey of interior and exterior surfaces and the review of x-rays filmed in 1979. Not only was it possible to recreate the appearance of the original system of pulls, wires, cranks, and bells, but the system was made operable.

Monitoring System

The site's high visitation meant that the building conditions required active monitoring, not just a visual

survey. A computerized data-acquisition system was designed to monitor environmental conditions. Temperature and humidity sensors were installed in the cellar, on each floor, and on the exterior. Relative-humidity sensors were installed in the foundation brickwork to monitor relative-moisture levels in the masonry, and two soil-moisture sensors were installed in the dirt floor of the cellar to monitor ground moisture. Information was recorded from each sensor hourly. The data was stored in two microcomputers located in the cellar and uploaded by modem on a weekly basis to the architects' office. The data, collected over a year, was analyzed to determine relationships between interior and exterior conditions and the impact of weather, open doors and windows, and the high number of tourists on the interior temperature and humidity.

Conclusion

In preparing the Mount Vernon historic structure report, it became very clear that such a report must be tailored to the building being studied and should not follow a recipe. Because of Mount Vernon's significance as one of the major icons of American history, and the large number of visitors it receives, it was critical that the special character and remaining historic fabric be identified and recorded accurately. This process will help to ensure that the integrity of the remaining historic fabric will survive the renovation campaigns required for the continued preservation of the building in the decades and centuries to come.

JOHN G. WAITE, FAIA, and CLAY S. PALAZZO are principals and CHELLE M. JENKINS is an associate in John G. Waite Associates, Architects, PLLC. JGWA is an architectural firm based in Albany, New York, specializing in the restoration, conservation, and rehabilitation of historic buildings nationwide.

Notes

1. For a more detailed explanation and specific examples of different types of historic structure reports see John G. Waite, *The Octagon's Historic Structure Report and Master Plan* (Washington, D.C.: American Architectural Foundation, 1992), 61-71.

2. In 1995, Mesick·Cohen·Waite Architects was dissolved and John G. Waite Associates, Architects, PLLC, was established.

3. Preliminary Report of the Committee on Barns and Outbuildings, Minutes of the Council, Mount Vernon Ladies' Association of the Union, 1935, 90.

4. The project staff included: partner-in-charge: John G. Waite; project manager: Clay S. Palazzo; project architect: Chelle M. Jenkins; associates: Douglas G. Bucher, William G. Foulks; architectural staff: Charles Barthe, Mark R. Dahl, Amy Facca, Dede Nash, Leslie Pultz, Lan Mei Wang; architectural historian: Diana S. Waite, of Mount Ida Press.

5. The committee was chaired by Neil Hortsman and consisted of James Rees, associate director (now resident director); Christine Meadows, curator; Dennis Pogue, archaeologist (now director of restoration); Thomas Lillis, director of operations and maintenance; Marc LeFrançois, architectural conservator; Barbara McMillan, librarian; John Riley, historian; and Harry Stevenson, intern.

6. George Washington to Sir John Sinclair, 6 November 1797, *The Writings of George Washington from the Original Manuscript Sources, 1745-1799*, ed. John C. Fitzpatrick (Washington, D.C.: U.S. Government Printing Office, 1931-40) 36:67.

7. Mount Vernon Historic Structure Report, vol. 3, 822; Reply of Thomas A. Edison to his electrical engineer R.C. Mitchell, Files of the Mount Vernon Ladies' Association of the Union.

8. Mount Vernon Historic Structure Report, vol. 3, 859. H.H. Dodge to Harriet C. Comegys, 13 June 1915, Files of the Mount Vernon Ladies Association of the Union.